PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :
B32B 5/16, 9/00, 15/02
B32B 17/02, 19/00, 21/02
B32B 23/02, 27/02

A1

(11) International Publication Number: WO 93/13938

(43) International Publication Date: 22 July 1993 (22.07.93)

(21) International Application Number: PCT/US93/00369

(22) International Filing Date: 20 January 1993 (20.01.93)

(30) Priority data:
07/823,307 21 January 1992 (21.01.92) US

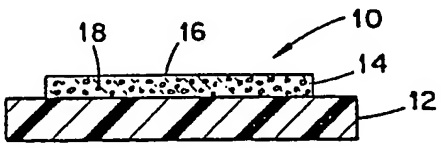
(71)(72) Applicant and Inventor: VAUGHN, Larry, F. [US/US]; 1158 Mansville Avenue, Indiana, PA 15701 (US).

(74) Agents: EDMUNDSON, Tracy, G. et al.; Luedeka, Hodges, Neely & Graham, 1030 First American Center, Knoxville, TN 37902 (US).

(81) Designated States: AU, CA, JP, KR, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: WATER COLOR PAINT CONTAINING MICROENCAPSULATED FRAGRANCES OR FLAVORS



(57) Abstract

A printable water color paint (18) containing microencapsculate fragrances (16) for being printed on a substrate (12) to form dried layers of paint and microcapsules (14) for subsequent transfer by a user. A water color paint (18) is mixed with microcapsules containing a desired fragrance (16) to provide a mixture (14) of water color paint containing dissolved pigments having microencapsulated fragrances dispersed therein. The liquid mixture is then printed to form layers of the paint and microcapsule mixture (14) on a substrate (12). The layers (14) are subsequently allowed to dry to form dried layers of pigment and microencapsulated fragrances (14). Subsequently the paint (18) and microcapsules (16) may be transferred by contacting the dried layer with a brush that has been wetted with a solvent so that the pigment (18) is redissolved and the microcapsules (16) are redispersed in the solvent. The contact by the brush with the layer also serves to load the brush with the dissolved pigment (18) and dispersed microcapsules (16) so that the mixture (14) can subsequently be transferred to another surface or object and allowed to dry. After the transferred mixture has dried the microcapsules (16) may be ruptured by the application of a shear force to the painted surface in order to release the microencapsulated fragrances which are designed to provide a fragrance of flavor effect.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	MR	Mauritania
AU	Australia	GA	Gabon	MW	Malawi
BB	Barbados	GB	United Kingdom	NL	Netherlands
BE	Belgium	GN	Guinea	NO	Norway
BF	Burkina Faso	GR	Greece	NZ	New Zealand
BG	Bulgaria	HU	Hungary	PL	Poland
BJ	Benin	IE	Ireland	PT	Portugal
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo			SE	Sweden
CH	Switzerland	KR	Republic of Korea	SK	Slovak Republic
CI	Côte d'Ivoire	KZ	Kazakhstan	SN	Senegal
CM	Cameroon	LI	Liechtenstein	SU	Soviet Union
CS	Czechoslovakia	LK	Sri Lanka	TD	Chad
CZ	Czech Republic	LU	Luxembourg	TG	Togo
DE	Germany	MC	Monaco	UA	Ukraine
DK	Denmark	MG	Madagascar	US	United States of America
ES	Spain	ML	Mali	VN	Viet Nam
FI	Finland	MN	Mongolia		

WATER COLOR PAINT CONTAINING MICROENCAPSULATED FRAGRANCES OR FLAVORS

Field of the Invention

This invention relates to the field of inks and paints containing microencapsulated chemicals and particularly to a water color paint containing microencapsulated chemicals which may be printed to form layers and subsequently re-wetted and transferred to paint art having "scratch and sniff" properties.

Background of the Invention

The use of microencapsulated chemicals to create scent and flavor effects is well known. The common "scratch and sniff" technique has been utilized to combine fragrance effects with printed material. For example, microencapsulated fragrances have been used to create "scratch and sniff" books or advertisements. A viewer of the material would scratch the printed areas resulting in a rupture of microcapsules such that the fragrance would be released and smelled.

Such techniques have gained wide popularity in advertising due to the fact that the visual impact of the advertisement is enhanced by the addition of the fragrance. The "scratch and sniff" technique has been used to enhance children's books in a similar manner. The impact of the combination of multiple sensory effects (i.e. sight and scent or flavor) provides for an enhanced memory of the material, a great plus both in advertising and education.

Despite the use of microencapsuled fragrances or flavors in advertising and printed materials, there is no "scratch and sniff" paint product available to consumers so that they may paint their own "scratch and sniff" artwork. The prior art in microencapsulated fragrances and printing materials relates almost exclusively to printing of a material such that the next step in the use of the material is the rupture of the microcapsules and release of the chemical. None of these prior art formulations provide a paint or ink containing microcapsules which may be initially printed but then

subsequently transferred as the user desires.

Therefore, it is an object of the present invention to provide a water color paint containing microencapsulated chemicals which may be printed in layers of sufficient thickness such that the paints and microcapsules may be subsequently transferred by a consumer. It is a further object of the present invention to provide for a method of production of water color paints containing microencapsulated fragrances in layers which may be transferred by a user of the product.

It is a further object of the present invention to provide a water color paint containing microencapsulated chemicals for use by an individual wishing to paint artwork having "scratch and sniff" effects.

It is a further object of the present invention to provide a painting toy which provides the user the ability to paint "scratch and sniff" artwork.

Summary of the Invention

In accordance with the above described objects the present invention relates to a printable water color paint containing microencapsulated chemicals which provide fragrance or flavor effects. In a preferred embodiment, a printable water color paint which contains water and water-soluble pigment and binders is mixed with a quantity of microcapsules containing a desired fragrance. The microcapsules are of a type which are pliable when contained in a liquid solution such that the microcapsules may be deformed without causing a rupture of the capsule and release of the chemical contents. In this embodiment, the liquid mixture of microcapsules and water color paint are printed on a substrate, such as paper, to form layers of water color paint containing microcapsules on the substrate. These layers of water color paint and microcapsules are then allowed to dry to form dry cakes or films of the water color paint and microcapsule mixture.

In a preferred embodiment the dried layer of water color paint and microcapsules on the substrate is of an

appropriate thickness and configuration so that a brush containing an appropriate solvent, i.e. water, may be contacted with the dried layer. Upon contact with the layer, pigment is redissolved in the solvent and the binders are broken down so that water color paint and microcapsules are redispersed in the solvent and picked up by the brush. The loaded brush may then be used to transfer color and microcapsules to a desired surface or object. After the transferred water color paint and microcapsule mixture has been allowed to dry, a viewer of the artwork may rupture the microcapsules, as by scratching the painted surface, to release the chemical to produce the desired effect. In a preferred embodiment the percentage of water color paint is between about 50% to 70% and the percentage of microcapsules is between about 30% and 50%. In another preferred embodiment the percentage of water color paint is about 60% and the percentage of microcapsules is about 40%.

Another preferred embodiment relating to the present invention is a method for the production and use of a water color paint containing microcapsulated fragrances. In this embodiment the method comprises the steps of mixing liquid water color paint with microcapsules containing the desired fragrance and printing the mixture to form layers of water color paint and microcapsules. The printed layer is allowed to dry so that it is ready for use. The next step entails contacting the dried layer with a brush containing an appropriate solvent so as to redissolve pigment and place microcapsules in dispersion in the solvent. The paint and microcapsules are then picked up by the brush and the loaded brush is used to transfer the color and microcapsules to a desired surface or object. Finally, after the transferred paint and microcapsules have been allowed to dry, the microcapsules may be ruptured by scratching the painted surface so that the fragrance contained in the microcapsules is released. Another embodiment relating to the present invention is a paint toy incorporating a

water color paint containing microencapsulated fragrances. In this embodiment, a liquid mixture of water color paint containing water soluble binders and microcapsules is printed onto a substrate, preferably a paper pallet. A variety of different color and microencapsulated chemical combinations may be printed on the substrate to provide a choice of color and effect combinations. The various layers of paint and microcapsules are allowed to dry so that the pallet consists of separate areas of dried paint and microcapsules. A wet brush is then contacted with the desired color and microcapsule combination so that the binders in the paint are dissolved and color and microcapsules may be loaded into the brush. The loaded brush may then be contacted with a surface which the person using the toy desires to paint. After the paint has dried, the microcapsules may be ruptured by scratching the painted surface to release the fragrance effect.

Brief Description of the Drawings

The previously described invention may best be understood with reference to the following detailed description in the drawings in which:

FIG. 1. is a cross-sectional view of a substrate bearing a printed layer of a paint/microcapsule mixture taken as indicated by reference line 1-1 in Fig. 2.

FIG. 2 is a representation of a painting toy utilizing a pallet of various paints/microcapsule layers, a brush and a preprinted page for painting.

Detailed Description of a Preferred Embodiment

With reference now to the drawings in which like reference numerals refer to like or corresponding features, there is shown in FIG. 1, a dried cake of paint and microcapsules 10 made in accordance with the present invention. Cake 10 consists of a substrate 12 onto which has been printed a paint mixture layer 14 containing water soluble pigments and binders 18 and microencapsulated fragrances 16. The layer 14 begins as

a liquid mixture of water soluble pigments and binders to which has been added microcapsules containing a desired fragrance. The microcapsules 16 are designed so that they are deformable and not easily ruptured when contained in a liquid medium so that they may be printed without rupturing. The paint/microcapsule mixture may then be printed onto a substrate 12 by a variety of printing means to form the layer 14 containing pigment and binders 18 and microcapsules 16; preferably the layer is between about 0.001" and 0.002" thick. After the layer 14 has dried, the cake 10 is ready for sale and use by a consumer.

In use, a user would dip a brush such as a common artist's paint brush, in appropriate solvent such as water. The brush would then contain solvent within the fibers and would then be contacted with the dried paint/microcapsule layer 14. Solvent from the brush would redissolve the pigment and binders 18 and redisperse the microcapsules 16. The contact of the brush with the layer 14 would also serve to load the brush with dissolved pigment and binder and dispersed microcapsules so that they could be transferred. The brush would then be contacted with something the user desired to paint and the dissolved pigment and binder and dispersed microcapsules would be transferred to that object by contact to the brush with that object.

Subsequently, the paint/microcapsule mixture would dry such that the pigment and microcapsules would form a dry film of pigment, binders and hardened microcapsules on the object painted. After the mixture had dried on the object, a person desiring to release the fragrance from the microcapsules could rupture the microcapsules, as by scratching with their fingernail, and the chemicals would be released so that the fragrance or flavor contained in the microcapsule could be detected by the person rupturing the microcapsules.

In a preferred embodiment, the preferred paint would be a water color paint such as that made by Colorcon,

Inc.; this paint is available in four basic colors red, yellow, blue and black with these four colors being combinable to form almost any other desired color. To the liquid paint, a water soluble binder, preferably carboxy methyl cellulose, would be added in sufficient quantity, preferably between about 1.0% and 2.0%, to allow the paint to be printed in layers of desired thickness and to bind microcapsules within the layer. To the paint solution containing water soluble pigment and binders, microencapsulated chemicals such as those made by MICRO-SCENT, Inc., would be added to provide a liquid dispersion containing dissolved pigment and binders and dispersed microcapsules. The pigment and microencapsulated chemical would be selected so that the combination would provide for a desired visual and scent or flavor effect.

For example, a bright red pigment could be combined with a microencapsulated chemical which approximates the scent of cherries to provide a cherry-red paint/microcapsule mixture. The cherry-red mixture could be used to paint a picture of a cherry or any other object which the person would desire to have the cherry red color/fragrance combination. After the picture has been painted and the paint/microcapsule film has been allowed to dry, a viewer desiring to release the microencapsulated fragrance could then scratch the painted surface with their fingernail and release the microencapsulated fragrance so that the picture smelled of cherries.

A wide variety of color and fragrance or color and flavor combinations can be created to produce a wide variety of effects. For example, MICRO-SCENT, Inc., manufactures over one- hundred different microencapsulated fragrances and a large variety of different colored water color paints can be produced in ways well-known in the art.

In a preferred embodiment, the paint/microcapsule mixture is comprised of between about 50% to 70% liquid

paint containing dissolved pigment and binders and between about 30% to 50% microencapsulated chemicals. This mixture is mixed by a low shear mixing method to prevent the rupture of microcapsules. Upon completion of the mixing so that the microcapsules are uniformly dispersed in the liquid, the paint/microcapsule mixture is provided as the ink in a printing procedure or may be injected or poured into prefabricated containers and allowed to dry to form cakes.

The preferred printing method is silk screen printing. In this procedure, the substrate 12 onto which a layer of paint and microcapsules 14 is to be printed is provided beneath a silk screen in a silk screen press; the preferred substrate is uncoated paper so that the layer will adhere to the paper fibers. The silk screen has been prepared in ways well-known in the art so that the liquid print/microcapsule dispersion will be printed onto the desired areas of the substrate. The paint/microcapsule mixture is provided on the surface of the silk screen opposite the substrate and a squeegee is passed over the top surface of the screen in order to force the paint/microcapsule mixture through the open portions of the screen and onto the substrate to form the layer 14. As was previously described, the microcapsules are of a composition so as to be deformable while in a liquid dispersion so that the shear forces incurred during the printing process will not rupture the microcapsules.

Subsequent to the printing, the layer 14 adheres to the substrate 12 by action of the binders and the printed substrate sheet is allowed to dry either by unassisted air drying or assisted heat drying. Upon drying, the layer 14 consists of a dried mixture of pigment and binder 18 and microcapsules 16.

It should be noted that a substrate 12 could be printed several times using different screen and paint/microcapsule combinations to provide separate areas of paint/microcapsule layers having various color and

scent combinations on a single sheet. In an alternate embodiment, the water soluble binder used could be polyvinyl alcohol or any other of a variety of water soluble binders. Additionally, in an alternate embodiment, the substrate could be a coated paper product or, in fact, could be any of a variety of appropriate substrates such as cardboard, wood or plastic. Finally, a variety of printing processes may be used to place the layer 14 on the substrate 12 such as flexagraphic, offset or gravure. It should also be noted that the liquid paint/microcapsule dispersion could be poured or injected into preformed trays and allowed to dry to form cakes.

Referring now to FIG. 2 there is shown a painting toy made in accordance with the present invention. The painting toy consists of a pallet 20 containing a variety of layers of various paint color/microencapsulated chemical layers 22, 24, 26 and 28. The pallet would consist of a substrate and dried layers of paint/microcapsules made substantially as described previously with reference to FIG. 1. In addition to the pallet 20, the paint toy would consist of a brush 30, such as a paint brush, cotton swab, or even a finger. A final component of the toy would consist of a preprinted page 32 having pictures outlined thereon 34, 36, 38 and 40 to be painted.

In use, the user would dip the brush 30 in an appropriate solvent such as water. The brush would then have the solvent contained within the fibers or on the surface so that when the brush 30 is brought in contact with one of the printed layers of color and microcapsules 22, 24, 26 or 28, the pigment and binder contained in the layer would be redissolved and microcapsules would be redispersed in the liquid as was previously described with reference to FIG. 1. This contact would serve to load the dissolved pigment and binder and dispersed microcapsules onto the brush 30 for transfer. Depending on the color/microcapsule combination selected, the loaded brush 30 could then be contacted with the printed

range of color and fragrance combinations. Therefore, the pictures on the preprinted page 32 could be a wide variety of pictures which convey the desired visual effect which is to be combined with the desired fragrance effect.

While the painting toy has been described with reference to a preprinted page 32 in FIG. 2, the painting toy could be used with a blank piece of paper so that the user could create any picture desired. Additionally, the transfer need not be made to a flat sheet as depicted in FIG. 2 or canvas, but could be painted on the surface of an object or applied in any manner that paints are typically applied so that the user of the product has a similar range of creativity available as would any other painter. However, unlike other pieces of painted artwork, a paint or pallet made in accordance with the present invention provides the painter the ability to create not only with colors but also with fragrances which provides for an enhanced sensory effect by stimulating not only the visual sense of the viewer but also stimulating the scent or taste sense of the viewer.

While a preferred embodiment of the present invention has been described herein, the present invention is capable of numerous alternate embodiments or changes, modifications or deletions without departing from the scope of the invention as defined by the claims; therefore, the foregoing detailed description of a preferred embodiment was by way of illustration and not limitation.

What I Claim is:

1. A paint product for being transferred with a wet brush comprising:

a substrate having at least one surface;

a transferable layer of dried paint and microcapsules transferably adhered to the surface,

said transferable layer of dried paint and microcapsules being water soluble, being disposed substantially above the surface of said substrate, and being of sufficient thickness such that said layer may be re-wetted and transferred by applying the wet brush to said layer to pick-up the re-wetted ink and microcapsules, said microcapsules being sufficiently durable when wet to withstand the transfer process whereby the wet brush may be used to transfer said ink and microcapsules from said substrate to another surface without rupturing said microcapsules, but said microcapsules being sufficiently fragile to brake when disposed in dry ink and scratched; and

a desired chemical contained within said microcapsules, said microcapsules being operative to release said desired chemical when said microcapsules are disposed in said dry ink and are scratched.

2. The product of Claim 1 wherein said transferable layer of dried paint and microcapsules is comprised of between about 50% and 70% water color paint and between about 30% and 50% microcapsules.

3. The apparatus of Claim 1 wherein said transferable layer of dried paint and microcapsules is comprised of about 60% water-color paint and 40% microcapsules.

4. The apparatus of Claim 1 wherein the dried paint is a water color paint containing water-soluble pigment and binders.

5. A painting toy comprising:

a sheet;

a paint brush for being wetted;

a canvas for being painted;

a plurality of colored patches printed on said

sheet,

each of said colored patches comprising a transferable layer of dried paint and microcapsules transferably adhered to said sheet, said transferable layer of dried ink and microcapsules being water soluble, being disposed substantially above the surface of said sheet, and being of sufficient thickness such that said layer may be re-wetted and transferred to said canvas by applying the wet brush to said layer to pick-up the re-wetted ink and microcapsules,

said microcapsules being sufficiently durably when wet to withstand the transfer process whereby the wet brush may be used to transfer said ink and microcapsules from said substrate to another surface without rupturing said microcapsules, but said microcapsules being sufficiently fragile to break when disposed in dry ink and scratched;

a desired fragrance contained within the microcapsules, said microcapsules being operative to release said desired chemical when said microcapsules are disposed in said dry ink and are scratched; and

a receiving sheet for being painted with the ink and microcapsules with said brush after said brush has picked-up the re-wetted ink and microcapsules from at least one of said colored patches.

6. The paint toy of Claim 5 wherein said transferable layer of dried paint and microcapsules is comprised of between about 50% and 70% water color paint and between about 30% and 50% microcapsules.

7. The paint toy of Claim 5 wherein said transferable layer of dried paint and microcapsules is comprised of about 60% water color paint and about 40% microcapsules.

8. The apparatus of Claim 5 wherein said dried paint is a water color paint comprised of water soluble pigments and binders.

9. A method for the preparation of a transferable paint product comprising the steps of:

mixing a liquid water color paint and microcapsules

containing a desired chemical to obtain a mixture of liquid water color paint and dispersed microcapsules;

printing the mixture onto a substrate to provide a layer of the mixture on the substrate of sufficient thickness such that the layer is transferable; and

drying the printed layer to provide a transferable layer of dried paint and microcapsules disposed on the substrate such that the dried paint and microcapsules may be transferred by contacting the layer with a wet brush so that the dried paint is redissolved and the microcapsules are redisperse and picked up by the brush.

10. The method of Claim 9 further comprising the steps of:

contacting the dried printed layer with a wet brush to redissolve the paint and redisperse the microcapsules and to load them onto the brush;

painting a desired surface by bringing the loaded brush into contact with a desired surface such that water-color paint and microcapsules are transferred to the desired surface;

drying the painted surface by allowing the solvent the paint mixture to evaporate; and releasing the desired chemical from the microcapsules by application of a shear force to the painted surface to rupture the microcapsules.

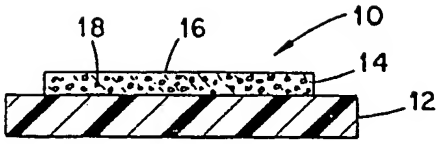


Fig. 1

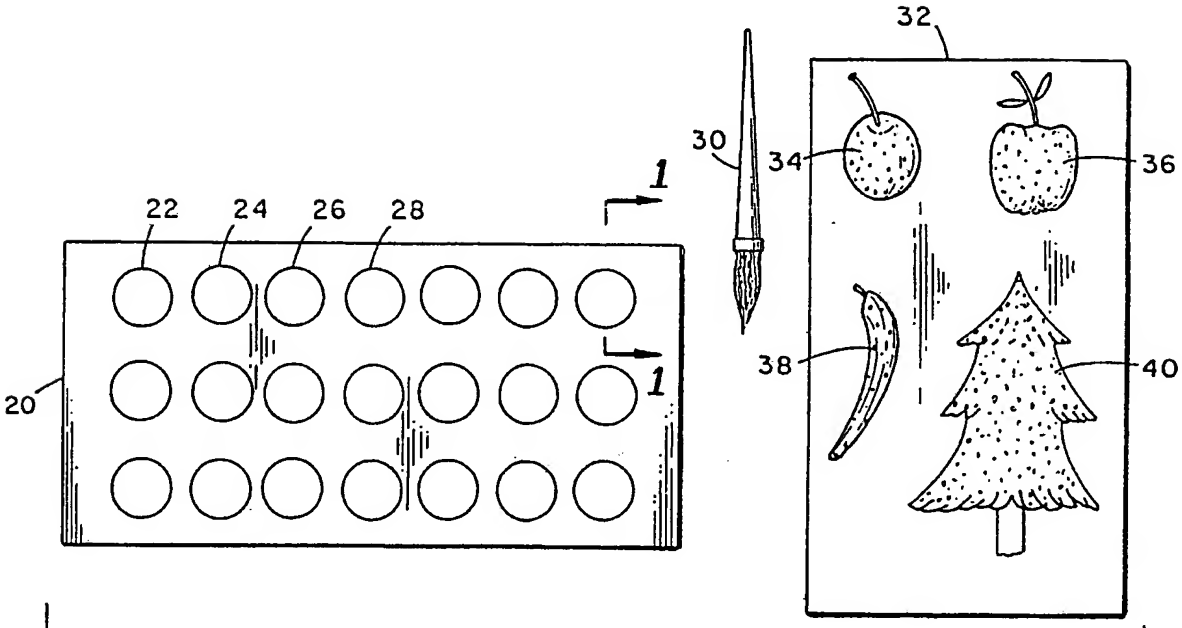


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/00369

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :B32B 5/16, 9/00, 15/02, 17/02, 19/00, 21/02, 23/02, 27/02
US CL :428/402, 402.2
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 428/402, 402.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US, A, 3, 578, 482 (WHITAKER et al) 11 MAY 1971, see entire document.	1,4 2,3,5-10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 26 APRIL 1993	Date of mailing of the international search report 19 MAY 1993
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. NOT APPLICABLE	Authorized officer ELIZABETH EVANS Telephone No. (703) 308-2351

Form PCT/ISA/210 (second sheet)(July 1992)★